

Passive Wireless Temperature Sensor for Harsh Environments, Phase

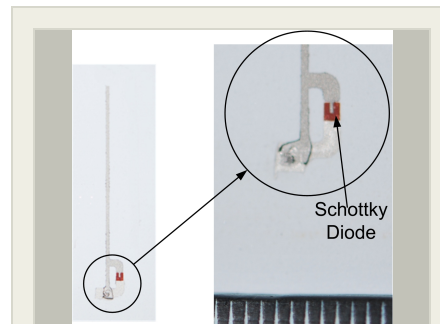
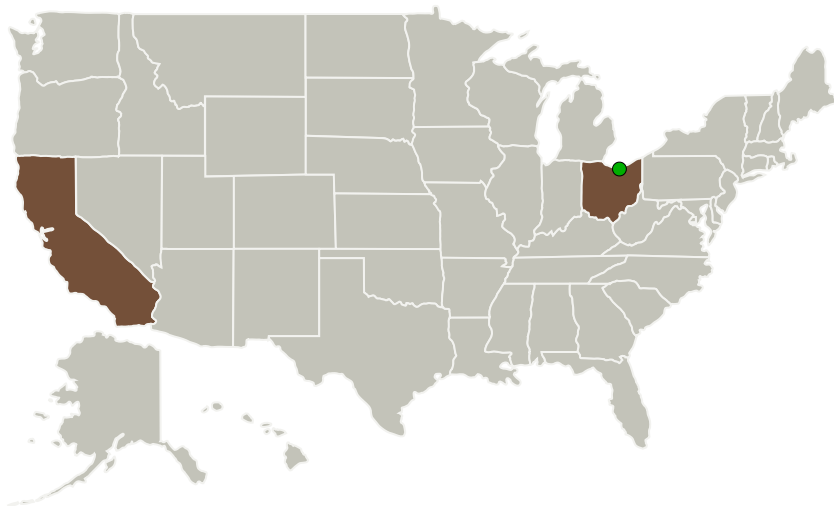
Completed Technology Project (2013 - 2013)



Project Introduction

Wireless Sensor Technologies has for several years been developing a passive Wireless Temperature Sensor (WTS) for gas turbine engine and other harsh environment applications under the under sponsorship of the Air Force (Non-destructive Test Program) and the Navy (SBIR Topic N08-004). Once productized, the functional and operational goals for the sensor as they relate to the gas turbine engine are to: ? Measure the surface temperature of the Yttria Stabilized Zirconia Thermal Barrier Coatings (YSZ TBC's) typically applied to turbine blades in the hot section of the gas turbine engines ? Measure temperature at specific locations on the surface of the combustor liner to determine both radial and circumferential temperature variations (pattern factor) o Thin film passive wireless sensors will be arrayed in an annular ring around the combustor to determine pattern factor in an effort to sense the uniformity of combustion downstream from the fuel injectors. ? Measure the surface temperature of any area of interest using a weldable coupon version of the wireless temperature sensor ? Measure heat flux across the section thickness of thermal barrier coatings by pairing several of the proposed wireless temperature sensors (for the surface temperature measurement of TBC's. This program will characterize the longterm drift and reliability of the WTS and in Phase 2 result in a sensor with a TRL level of 6 to 7.

Primary U.S. Work Locations and Key Partners



Passive Wireless Temperature Sensor for Harsh Environments

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Passive Wireless Temperature Sensor for Harsh Environments, Phase I

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Organizations Performing Work	Role	Type	Location
Wireless Sensor Technologies, LLC	Lead Organization	Industry	Encinitas, California
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

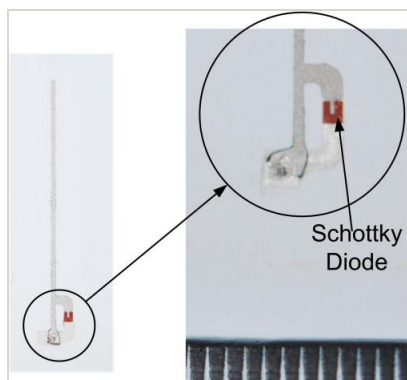
Primary U.S. Work Locations	
California	Ohio

Project Transitions

**May 2013:** Project Start**November 2013:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138399>)

Images

**Project Image**

Passive Wireless Temperature Sensor for Harsh Environments
(<https://techport.nasa.gov/image/131268>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Wireless Sensor Technologies, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

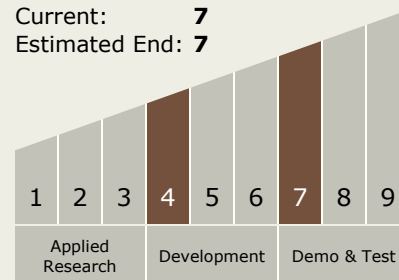
Carlos Torrez

Principal Investigator:

John Conkle

Technology Maturity (TRL)

Start: 4
Current: 7
Estimated End: 7



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.3 Mechanical Systems
 - └ TX12.3.4 Reliability, Life Assessment, and Health Monitoring

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System